

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 15 May 2000 (15.05.00)	
International application No. PCT/GB99/03026	Applicant's or agent's file reference JL2215 (P2724PCT)
International filing date (day/month/year) 13 September 1999 (13.09.99)	Priority date (day/month/year) 12 September 1998 (12.09.98)
Applicant MCNIE, Mark, Edward	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

06 April 2000 (06.04.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Pascal Piriou Telephone No.: (41-22) 338.83.38
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PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference JL2215 (P2724PCT)	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 99/ 03026	International filing date (day/month/year) 13/09/1999	(Earliest) Priority Date (day/month/year) 12/09/1998
Applicant THE SECRETARY OF STATE FOR DEFENCE DEFENCE EVAL...		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

FORMATION OF A BRIDGE IN A MICRO-DEVICE

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

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☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 99/03026

B x I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1-32
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

B x II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-32

Present claims 1 to 32 relate to an extremely large number of possible methods and devices. In fact the claims contain so many options and possible permutations that a lack of clarity and conciseness within the meaning of Article 6 PCT (see also Rule 6.4 PCT) to such an extent as to render a meaningful search of the claims impossible. Full support by the description is lacking. Furthermore the initial phase of the search revealed a very large number of documents relevant to the issue of novelty. So many documents were retrieved that it is impossible to determine which parts of the claims may be said to define subject matter for which protection may legitimately be sought (Article 6 PCT). For example any process for forming an interconnection by filling a via-hole directly anticipates claim 1 and any micromachine wire-bonded to a support anticipates claim 28. For these reasons, a meaningful search over the whole breadth of the claims is impossible. Consequently, the search has been restricted to the formation of a micromachine comprising the formation of a freely suspended track over a moving part while using a sacrificial layer.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/03026

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01P1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B81B G01P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 686 743 A (LAMMERT) 11 November 1997 (1997-11-11) figures ---	1-32
X	EP 0 451 992 A (GUCKEL ET AL) 16 October 1991 (1991-10-16) figures 12,13 ---	1-32
X	EP 0 582 797 A (BENNET ET AL) 16 February 1994 (1994-02-16) figures 3,5 ---	1-32
X	US 5 324 683 A (FITCH ET AL) 28 June 1994 (1994-06-28) figures ---	1-32
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

15 December 1999

Date of mailing of the international search report

04.01.00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Gori, P

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/03026

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 997 521 A (HOWE ET AL) 5 March 1991 (1991-03-05) figure 8E -----	1-32

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/03026

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5686743	A	11-11-1997	EP 0818816 A	14-01-1998
			JP 10065006 A	06-03-1998
			US 5817446 A	06-10-1998

EP 451992	A	16-10-1991	US 5090254 A	25-02-1992
			AT 125040 T	15-07-1995
			DE 69111118 D	17-08-1995
			DE 69111118 T	23-11-1995
			JP 2017572 C	19-02-1996
			JP 5332852 A	17-12-1993
			JP 7006852 B	30-01-1995
			US 5188983 A	23-02-1993

EP 582797	A	16-02-1994	US 5337606 A	16-08-1994
			DE 69306687 D	30-01-1997
			DE 69306687 T	12-06-1997
			HK 1004293 A	20-11-1998
			JP 6109759 A	22-04-1994

US 5324683	A	28-06-1994	US 5510645 A	23-04-1996

US 4997521	A	05-03-1991	US 4943750 A	24-07-1990

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REC'D 20 DEC 2000

WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference JL2215 (P2724PCT)	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) FOR FURTHER ACTION	
International application No. PCT/GB99/03026	International filing date (day/month/year) 13/09/1999	Priority date (day/month/year) 12/09/1998
International Patent Classification (IPC) or national classification and IPC G01P1/00		
Applicant THE SECRETARY OF STATE FOR DEFENCE DEFENCE EVAL...		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 9 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 06/04/2000	Date of completion of this report 19.12.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Gori, P Telephone No. +31 70 340 2963 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB99/03026

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

Description, pages:

1-22 as originally filed

Claims, No.:

1-22 with telefax of 28/09/2000

Drawings, sheets:

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☒ the claims, Nos.: 23-32

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03026

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☒ the entire international application.

☐ claims Nos. .

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☒ the claims, or said claims Nos. 1-22 are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03026

	No:	Claims	1-22
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-22
Industrial applicability (IA)	Yes:	Claims	1-22
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item I

Basis of the report

The amendments filed with the telefax dated 28.09.2000 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT.

The amendments concerned are the following:

In the claims as originally filed a partial filling of the channel was only to be found at claim 17, dependent upon claim 4, specifying that the substrate comprises a suspended portion, substantially free from the bulk, the suspended portion extending over the channel. This is also the information to be retrieved in the description, which constantly and repeatedly emphasizes on said suspended portion, see e.g. the figures. The omission in claim 1 of the features relating to the suspended portion adds subject matter which was not disclosed in the application documents.

Additionally the infill material, when formed in such a way that it partially fills the channel, is not formed by any possible method, but is deposited.

Consequently the application does not meet the requirements of Art. 34(2) PCT.

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Amendments to the claims have introduced the features of bridging a channel by partially filling the uppermost region of the channel. These features were not to be found in the originally filed claims since original claim 17, as far as it could be understood, only referred to claim 4.

Claim 1 as filed on 22.08.2000 has consequently not been searched and thus cannot be examined (Rule 66(1)(e) PCT).

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03026

Due to the comments under items I and III and the limitation brought to the search by the International Searching Authority on the claims as originally filed, it is not possible to draft a precise examination report. Consequently the present report only summarizes the teachings of the prior art :

Reference is made to the following documents:

- D1 : EP-A-0 451 992 (GUCKEL ET AL) 16 October 1991 (1991-10-16)
- D2 : EP-A-0 582 797 (BENNET ET AL) 16 February 1994 (1994-02-16)
- D3 : US-A-4 997 521 (HOWE ET AL) 5 March 1991 (1991-03-05)
- D4 : US-A-5 686 743 (LAMMERT) 11 November 1997 (1997-11-11)

1. The document D1 discloses, see the figures and column 9, line 28 to col. 10, line 29 a process wherein
 - a layer (poly 34) is deposited to form a moving part (Fig. 7, 8),
 - a sacrificial layer is deposited and patterned (oxide or nitride 63, Fig. 9, 10),
 - a layer for forming a track is deposited and patterned (poly 64 (Fig. 11 and 12),
 - the sacrificial layer 63 is etched, while also etching the layer (56) below the poly (34), leaving a conductive bridge over the moving part.

This document consequently discloses the concept of bridging a moving/suspended part.

2. The document D2 discloses, see Fig. 2 to 5 and column 3, line 24 to column, a process wherein
 - a layer to form a moving part (poly 16) is deposited and covered by a sacrificial layer (28), Fig. 2;
 - a conductive track is deposited and patterned, (22,23,25, Fig. 4),
 - the sacrificial layer is etched, leaving a conductive bridge (22, 28) over a moving part (beam 16), see also Fig. 3.

Consequently the same conclusions as above can be drawn from the disclosure of D2.

3. The document D3 discloses, see Fig. 8a to Fig. 8e and column 13, line 56 to column 14, line 47, discloses again the formation of a bridge on a moving/suspended part. D3 also adds the teachings that the stator (47, Fig. 8d) can be fixed to the substrate at a single point.

4. D4 discloses a process for forming conductive tracks over metal lines in the frame of integrated circuit fabrication, see the Figures and col. 3, line 40 to column 4, line 55. In D4 a metal line is formed, a sacrificial photoresist layer is deposited and a patterned metal layer is formed on top of the sacrificial photoresist. Finally the photoresist is etched (lift-off) to leave a conductive track suspended over a metal line.

The inventive concept of the present application, as far as it can be understood now, would differ from the teachings of D4 only in that the device is a micro-mechanical device. As far as it can be seen, this slight difference would not be considered to involve an inventive step, since the skilled person would have applied a technique used to fabricate semiconductor devices to the fabrication of a micro mechanical device, because the fabrication of said micro mechanical devices finds its origin in the semiconductor technology.

5. A process wherein a bridging sacrificial material and a layer of another material are deposited onto a suspended moving part, before the bridging sacrificial material is removed, thereby leaving a bridge of said material over said suspended moving part, is not disclosed in the prior art, and does not follow directly from the teachings of said prior art.

6. The claims should be industrially applicable, Art. 33(4) EPC.

Re Item VII

Certain defects in the international application

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the background art relevant for the present application is not mentioned in the description.

Re Item VIII

Certain observations on the international application

The claims 1 to 26 as filed on 28.09.2000 are obscure, contrary to the requirements of Art. 6 PCT.

The formulation of claim 1 is so vague, and uses so undefined terms that its scope cannot be determined :

- the term "micro-machining" is unclear, and has no precisely determined meaning; the prefix "micro" has different meanings according to the context : "up to 1 mm" in the present application, see page 3, line 22, 0.01 to 0.1 mm in "micro-surgery", 0.01-1 micron in micro-lithography. For "micro-mechanical", a range extending from 10 cm to 1 micron can be envisaged according to the related art. It is thus unclear which kind of limitation the contested term attempts to bring to the claim, PCT Guidelines, section IV, III.4.5. Additionally the possibility of having conductive tracks would lead to at least an electromechanical device. The limitation brought by said term is thus obscure.
- the term "infill material" is a functional term (material having the function to fill in) which is obscure since in claim 1 the cavity is not filled. Additionally said infill material need to be patterned and etched, and these steps obviously take place on the second material outside the channel. Consequently the infill material does not fill the trench, but is deposited outside the trench. The used term consequently appears inappropriate, and the use of inappropriate terms to define the invention causes an obscurity.
- a "bridge" is generally understood as a suspended portion making a link between two separate items (banks). In claim 3 the bridging material may contact only one of these items, so that again the term "bridging" appears inappropriate.

The use of inappropriate terms, or terms having a meaning which is not the meaning they generally have in the art, obscures the claims (PCT Guidelines section IV, III.4.2).

Claim 7 specifies that the infill material can be deposited before the etch/release of the suspended portion, so that no channel exists when the infill material is deposited. This further obscures claim 1. In the same manner it is clear from the description that the features of claim 14 are selected to allow a complete filling of the trench, so that the scope of claim 1 is further obscured.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/03026

Consequently the scope of claim 1 cannot be determined, contrary to Art. 6 PCT. Additionally the claims put undue burden on thirds trying to understand the invention.

Multiple dependent claims form also the basis of other multiple claims (Rule 6(4)(a), second sentence). In the present case this is considered to obscure the scope of the claims, due to the large number of variations which are concerned.

Additionally claim 1 is not supported by the description : the vague wording allows a multitude of final configurations, as indicated by the International Searching Authority, the largely known process of forming an interconnection by depositing an insulating layer (infill material) on a substrate, forming a hole and depositing a material identical to the substrate, being also included in the scope of claim 1 as originally filed. The level of generalization of the original claims is excessive (PCT Guidelines, section IV, III.6.2). The inclusion in the scope of the claims of processes currently known in the prior art also puts undue burden on the thirds.

CLAIMS

09 11/10/01

1. A method of micro-machining comprising providing a primary region of at least a first material which contacts a second material at at least one end portion thereof, the method comprising providing an infill material on to the second material, patterning and etching said infill material to form a hole through the infill material to the second material, depositing the first material on to said infill material so that the at least one portion of the first material contacts the second material through the hole.
2. A method according to claim 1 comprising removing the infill material once the first material has been provided.
3. A method according to claim 2 comprising providing at least a portion of the primary region which is freely suspended above the second material.
4. A method according to claim 3 comprising micro-machining structures from a substrate and creating at least one device suspended portion, which is substantially free from the bulk of the substrate and providing at least one channel separating the device suspended portion from the bulk of the substrate and providing the freely suspended portion of the primary region extending over the channel.
5. A method according to claim 4 comprising creating the freely suspended portion of the primary region extending over the device suspended portion.

6. A method according to any one of the preceding claims comprising depositing a conductive material as the first material.
7. A method according to any one of the preceding claims comprising
5 forming a track with the primary region.
8. A method according to any preceding claim wherein the primary region is provided as a plurality of materials.
- 10 9. A method according to claim 8 comprising providing a supporting layer and one or more conductive layers.
10. A method according to any claim directly or indirectly dependent upon claim 4 comprising performing a sacrificial etch to release the
15 device suspended portion from the bulk of the substrate before the infill material is provided.
11. A method according to any claim directly or indirectly dependent upon claim 4 comprising performing a sacrificial etch to release the
20 device suspended portion from the bulk of the substrate after the infill material is provided.
12. A method according to claim 11 which comprises using a material for the primary region which is not substantially etched in the sacrificial
25 etch.
13. A method according to any preceding claim which comprises using any one of the following materials as the first material: TiW (or an alloy of Ti and W), Aluminium, Aluminium Copper, Aluminium Silicon, Ti,
30 Tungsten, Aluminium Silicon Copper, polysilicon, a metal.

14. A method according to any preceding claim which comprises depositing the infill material using Plasma Enhanced Chemical Vapour Deposition (PECVD).

5

15. A method according to any preceding claim which comprises depositing one of the following materials as the infill layer: an oxide, a nitride, an oxynitride, polysilicon.

10 16. A method according to any preceding claim which comprises using a dual frequency PECVD system to deposit the infill material wherein the plasma is generated at a first frequency and species accelerated toward the second material at a second frequency.

15 17. A method according to any preceding claim directly or indirectly dependent upon claim 4 which comprises depositing material in a top region of the channel.

18. A method according to claim 17 which causes the deposited
20 material to expand laterally across the channels.

19. A method according to claim 18 comprising causing the deposited material to cap the channel sealing the channel at the top region.

25 20. A method according to any claim directly or indirectly dependent on claim 2 which comprises using an etching process to remove the infill material.

21. A method according to any one of claims 1 to 13 which comprises
30 using any one of the following for the infill material: a polymer material,

26

a polyimide, a photoresist, PIQTM, spin on glass, or other spin on dielectric.

22. A method according to claim 21 as it depends directly or indirectly upon claim 4 which comprises flowing the infill material so that it flows into the channel.

23. A method according to claim 21 or 22 which comprises using a dry etching process to remove the infill material.

10

24. A method according to claim 21 as it depends directly or indirectly upon claim 4 which comprises using the infill material to bridge the channel.

15 25. A method according any one of claims 1 to 13 which comprises using a photoresist as the infill material and further comprises using a mask to develop the photoresist and then etching the mask to remove portions of photoresist.

20 26. A method according to any one of claims 1 to 13 which comprises using a polyimide as the infill material and subsequently applying a photoresist on top of the infill material to allow the infill material to be patterned and etched.

25 27. A method of narrowing micro-machined channels in a material comprising depositing a material in substantially only a top portion of the channel using plasma enhanced chemical vapour deposition (PECVD).

28. A micro-mechanical device comprising a conductive track anchored at at least one end portion to a portion of the device and the track being freely suspended.
- 5 29. A device according to claim 28 wherein the track is anchored to the device at both end portions.
30. A device according to claim 28 or 29 wherein the track passes over a device suspended portion which is substantially free from the remainder
10 of the device.
31. A device according to any one of claims 28 to 30 which comprises a channel which has been narrowed at a top portion.
- 15 32. A device according to claim 31 wherein the channel is sealed at the top portion.